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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/520,229	01/03/2005	Pieter J. Van Der Zaag	GB03 0056 US	5146

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EXAMINER	
MOVVA, AMAR	
ART UNIT	**PAPER NUMBER**
2891	

DATE MAILED: 09/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/520,229	VAN DER ZAAG ET AL.	
	Examiner	Art Unit	
	Amar Movva	2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 October 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1-3-05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 5 is objected to because of the following informalities: "the gate electrode" lacks antecedence. Appropriate correction is required.

2. Claim 11 is objected to because of the following informalities: the claim language "a TFT" is already used in claim 10. Examiner suggests applicant change "a TFT" to "the TFT". Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-2 , 5, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Zhang '733.

a. Regarding claims 1-2, 5-6, and 14 Zhang discloses an electronic device comprising a TFT, the TFT including a channel defined in a layer of polycrystalline semiconductor material produced by crystallising amorphous semiconductor material using metal atoms to promote the crystallisation process, wherein the semiconductor material includes an average concentration of the metal atoms in the range 1x10^18 to 2x10^19 atoms/cm^3. (Fig. 2(E), Example 2) The gate electrode of the TFT comprises a Tantalum metal silicide (Example

2). Furthermore the electronic device forms the active plate of a active matrix display device.

b. Regarding claims 7-9 and 13 Zhang discloses a method of manufacturing an electronic device including the steps of: (a) depositing amorphous semiconductor material on a substrate; (b) adding nickel metal atoms by implantation to the semiconductor material at an average concentration therein in the range 1x10^18 to 2x10^19 atoms/cm^3, the metal atoms being suitable for accelerating the crystallisation of amorphous semiconductor material; and (c) annealing the amorphous semiconductor material to form polycrystalline semiconductor material (Example 2).

5. Claim 6 is rejected rejected under 35 U.S.C. 102(b) as being anticipated by Zhang '733 in view of Ohtani '846.

Zhang discloses the electronic device of claim 1 and that the gate electrode of the TFT comprises a Tantalum metal silicide (Example 2, Zhang). Ohtani is provided to evidence the fact that Tantalum is suitable for promoting the crystallization process (col. 2, Ohtani).

7. Claims 10 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Takemura '254.

Takemura discloses discloses a method of manufacturing an electronic device including the steps of: (a) depositing amorphous semiconductor material on a

substrate; (b) adding nickel metal atoms to the semiconductor material at an average concentration therein in the range 1x10^17 to 1x10^20 atoms/cm^3 (Emodiment 2, lines 45-55 in col. 2), the metal atoms being suitable for accelerating the crystallisation of amorphous semiconductor material; and (c) annealing the amorphous semiconductor material to form polycrystalline semiconductor material (Embodiment 2). The annealing process is carried out for 4 hours at a temperature of 500-620 degrees Celsius, and a TFT is formed with its channel defined in the polycrystalline semiconductor material which exhibits a minimum leakage current of around 2.5x10^-12 A/um or less at a source-drain voltage of 5V with a channel width of 500-1000 um (Embodiment 2, lines 65-67 in col. 1 and lines 1-10 in col. 2). Since the method of Emodiment 2 follows the limitations of the claims and relevant portions of the disclosure, the structure resulting from Takemura's method would meet the requirements for minimum leakage current.

4. Claims 1, 3, and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Zhang '944.

Regarding claims 1, 3, and 4 Zhang discloses an electronic device comprising a bottom gate TFT, the TFT including a channel defined in a layer of polycrystalline semiconductor material produced by crystallising amorphous semiconductor material using metal atoms to promote the crystallisation process, wherein the semiconductor material includes an average concentration of the metal atoms in

the range 1x10^18 to 5x10^18 atoms/cm^3. (Fig. 2(E), Example 2) The gate electrode of the TFT comprises a Tantalum metal (Example 2).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yang '323 in view of Zhang '944.

a. Yang discloses a method of manufacturing an electronic device including the steps of: (a) depositing amorphous semiconductor material on a substrate; (b) adding metal atoms to the semiconductor material, the metal atoms being suitable for accelerating the crystallisation of amorphous semiconductor material; and (c) annealing the amorphous semiconductor material to form polycrystalline semiconductor material and additionally wherein a TFT is formed with its channel defined in the polycrystalline semiconductor material which has a bottom gate configuration, the method comprising a back channel etch step. (lines 25-67, col. 4 and col.5, Fig. 2E). Yang, however does not disclose that the average concentration of metal atoms added to the semiconductor material was in the range 1x10^18 to 2x10^19 atoms/cm^3.

b. Zhang discloses a bottom gate TFT with average concentration of metal atoms added to the semiconductor material was in the range 1x10^17 to 1x10^19 atoms/cm^3 (lines 60-67, col. 3 and lines 1-15, col. 4).

c. It would of have been obvious to one of ordinary skill in the art at the time of the invention to have used Zhang's range of average concentration of metal atoms' in the semiconductor material into Yang's semiconductor material.

d. The motivation to do so would have been to have a high enough metal concentration to allow for faster crystallization and low enough not to interfere in Silicon's semiconductor properties (lines 60-67, col. 3 and lines 1-15, col. 4 in Zhang '944 and lines 45-55 in col. 2 in Takemura).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amar Movva whose telephone number is 571-272-9009. The examiner can normally be reached on 7:30 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bradley Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Amar Movva
Examiner
Art Unit 2891

am

BRADLEY BAUMEISTER
PRIMARY EXAMINER